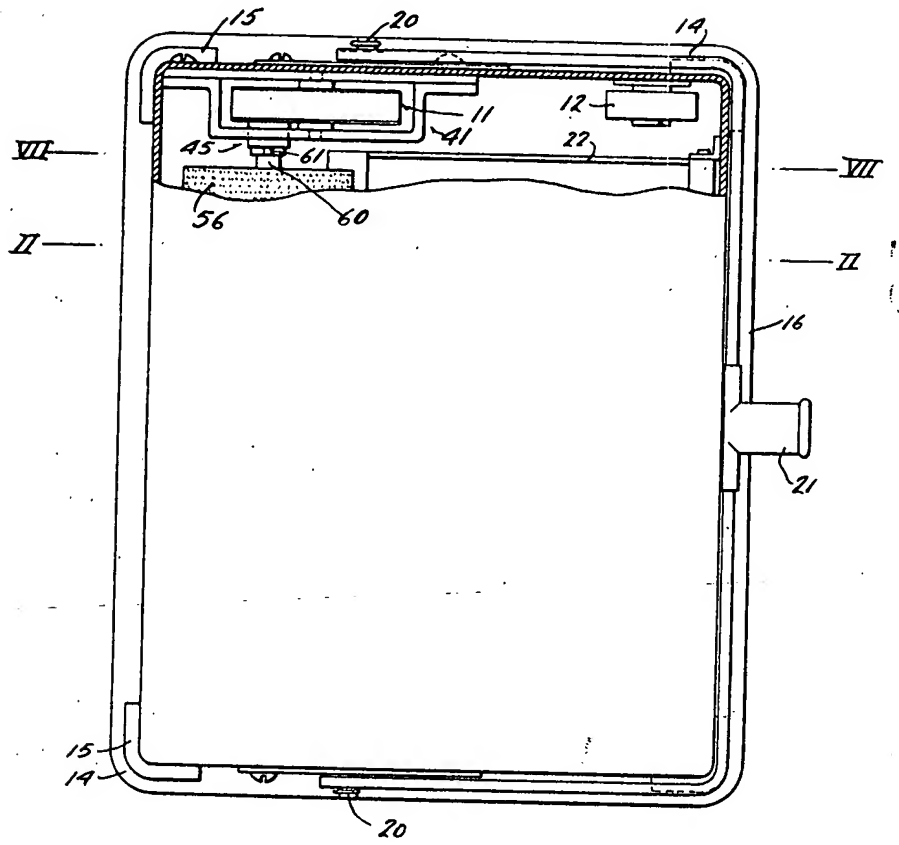

Fig. 1.

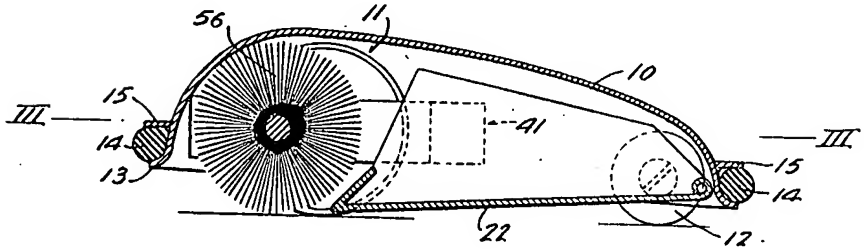

Fig. 2.

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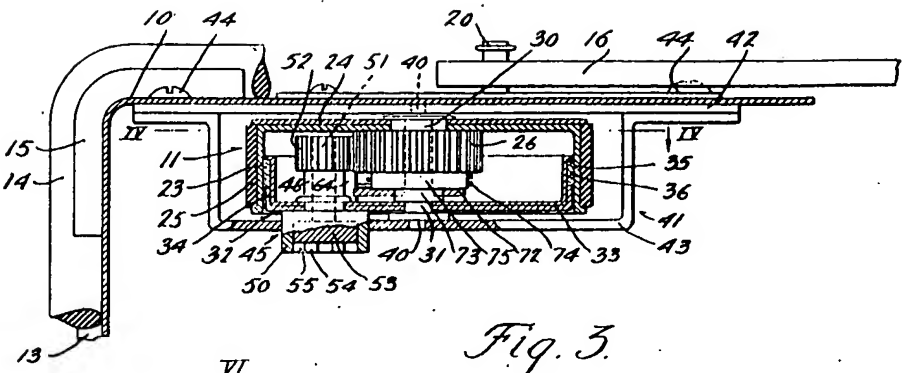

Fig. 3.

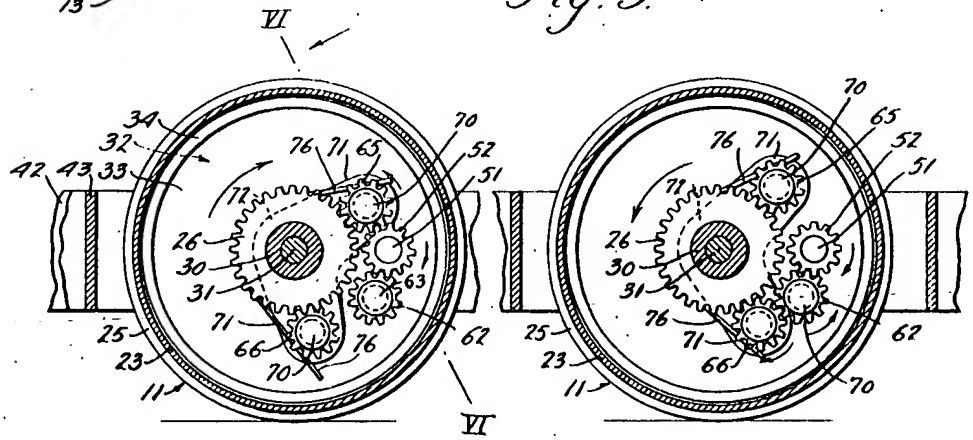

Fig. 4.

Fig. 5.

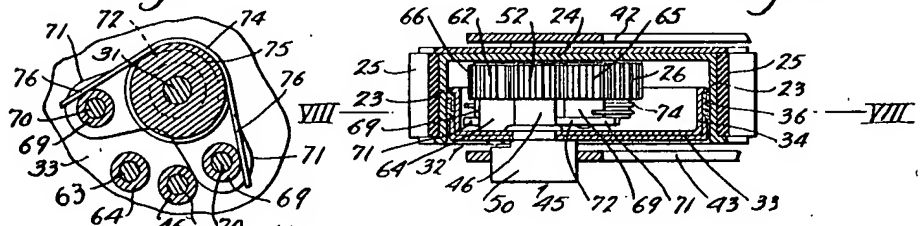

Fig. 8.

Fig. 6.

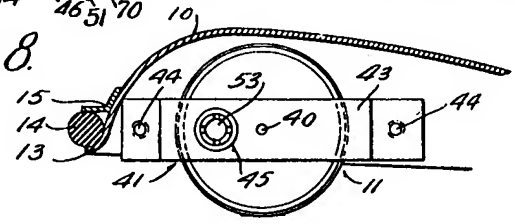

Fig. 7.

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453,063

CANADA

THE PATENT OFFICE

PATENT No. 453,063 ISSUED NOV. 30, 1948

Gear Mechanism for Carpet Sweepers and the Like

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My invention relates in general to carpet sweepers and more particularly to the means for connecting the traction wheels thereof with the rotating brush whereby the latter will be driven in the same direction irrespective of the direction of rotation of the traction wheels.

The principal object of my invention has been to provide suitable gear means whereby the brush of the sweeper will be operated uni-directionally during the back and forth movement of the sweeper.

Moreover, it has been an object to provide connecting means of improved construction having relatively few parts so designed and arranged as to be trouble-free over long periods of service.

The above objects and advantages have been accomplished by the device shown in the accompanying drawings, of which:

Fig. 1 is a plan view of my sweeper;

Fig. 2 is a transverse sectional elevation thereof taken on line II—II of Fig. 1;

Fig. 3 is an enlarged sectional plan view taken on line III—III of Fig. 2;

Fig. 4 is a sectional view taken on line IV—IV of Fig. 3 showing the gears in one operating position;

Fig. 5 is a similar sectional view taken on line IV—IV of Fig. 3 showing the gears in the other operating position;

Fig. 6 is a sectional view through one of the traction wheels taken on line VI—VI of Fig. 4;

Fig. 7 is a reduced fragmentary sectional view taken on line VII—VII of Fig. 1; and

Fig. 8 is a sectional plan view taken on line VIII—VIII of Fig. 6.

My device is illustrated by way of example herein, in connection with a sweeper comprising a casing 10 mounted upon suitable traction wheels 11 located near the front of the casing and supporting wheels 12 located near the rear thereof. The casing is provided around its peripheral edge with an outturned flange 13 for the support of a buffer 14 which is preferably of soft rubber, whereby the marring of furniture with which the cleaner may contact is avoided. The buffer 14 is held in position upon the flange by means of corner pieces 15 which are suitably secured to the casing and overhang the buffer. The casing is provided with a bail 16 which is pivotally attached to the casing by means of pivot pins 20. The bail has a socket

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member 21 for the reciprocation of a suitable handle. A dust collecting pan 22 is provided for the sweeper and is suitably supported so as to permit easy disposal of the collected dust.

Each of the traction wheels 11 of my invention comprises a wheel rim 23 carried by a wheel disk 24. The rim 23 of the wheel is formed with suitable edge flanges between which is mounted a tire 25, preferably of flexible material whereby traction is given to the wheel as it is moved back and forth across the surface being cleaned. A driving gear 26 is disposed centrally within the traction wheel and it is formed with a supporting boss 30 which is disposed within a suitable aperture formed in the wheel disk and by which it is permanently secured thereto. The driving gear is formed with a central aperture in which a wheel shaft 31 is disposed. Mounted within the wheel rim is a brush supporting shell 32. This shell is formed with a shell disk 33 and with a periphery 34. One end of the wheel shaft 31 is carried by the shell disk and is rigidly secured thereto by suitable flanges formed on the shaft. The periphery 34 is formed with an annular groove 35 for the reception of a dust ring 36 whereby the interior of the traction wheel is made dust-proof and sealed against leakage of lubricant contained therein. Each end of the wheel shaft 31 is formed with a bearing portion 40 for supporting the wheel within a supporting bracket 41. This bracket comprises a back plate 42 and a yoke 43 which are secured together and to the side wall of the casing by means of suitable screws 44.

Carried by the disk 33 of the brush supporting shell is a coupling member 45 comprising a bearing sleeve 46, secured to the disk 33 and extending into the interior of the traction wheel, and a socket portion 50 located on the outside of the disk. The bearing sleeve rotatably supports a coupling stud 51 having a brush pinion 52 secured to its inner end and a coupling head 53 formed at its outer end, said head being disposed within the socket portion 50 of said coupling member. The coupling head is formed in its outer end surface with a counter-bore 54 extending from which are a plurality of equi-distantly spaced slots 55. The brush 56 of my device is mounted upon a suitable shaft 60 which has its ends formed to fit into the counterbore 54 of the coupling members and which is formed with ridges 61 for engagement with the

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slots 55 of the head, whereby the brush is rotatably connected to the coupling member.

Reference is now to be had to Figs. 4 and 5 where I show the gearing for connecting the traction wheel with the brush. As here shown, an idler pinion 62 is rotatably mounted upon a stud 63 which passes through a supporting sleeve 64 and is suitably secured to the disk 33 of the shell. This idler pinion is in fixed meshing relationship with the brush pinion 52, and the axes of the brush pinion and idler pinion are equidistant from the axis of the driving gear 26, but are in non-meshing engagement therewith. Driving pinions 65 and 66 are rotatably mounted upon studs 70, one secured to each of the arms 71 of a pinion yoke 72. The studs pass through spacers 69 which are secured to the arms of the yoke. The studs 70 are so radially spaced with respect to the axis of the driving gear that the pinions 65 and 66 carried thereby are in constant meshing engagement with the drive gear 26. The pinions are, however, so spaced from each other that a rocking movement of the yoke is required to bring them alternately into meshing engagement with the cooperating pinions, as will hereinafter be more fully described. The pinion yoke is mounted for oscillation upon a reduced portion 73 formed on the driving gear 26. During the alternate rotative movements of the traction wheels, it is desirable that the yoke follow such rotative movement to the limits of its back and forth oscillatory movements, and to this end, I provide a friction spring 74. The spring has an annular part wound about a reduced portion 75 formed on the driving gear and it is provided with arms 76 which bear against the spacers 69 of the pinions 65 and 66.

Referring again to Figure 4, it will be seen that when the traction wheel 11 and the driving gear 26 carried thereby are rotated in clockwise direction as indicated by the arrow in that figure, the pinion yoke 72 will be caused to rotate therewith to the limit of its restricted movement owing to the engagement of one of the arms 76 of the friction spring with the spacers 69 of the pinion 65 and the frictional engagement of said spring with said driving gear thus serving to impel the yoke around with said gear until the pinion 65 is brought into meshing engagement with the brush pinion 52. During continued rotation of the traction wheel in clockwise direction, the brush pinion will be rotated in clockwise direction while the pinion 65 connecting it with the driving gear will be rotated in counterclockwise direction. When now the direction of motion of the sweeper is reversed and the traction wheel 11 is rotated in counterclockwise direction as indicated by the arrow in Fig. 5, the pinion yoke 72 will be rotated with the driving gear in the opposite direction, by engagement of the other arm 76 of the friction spring with the spacer 69 of the driving pinion 66, thereby bringing this pinion into meshing engagement with the idler pinion 62. Since the driving gear 26 is now rotating in counterclockwise direction, the meshing pinion 66 will be driven in clockwise direction, and since the idler pinion 62 is now in mesh with this drive pinion its clockwise rotation will cause the brush pinion 52 to be driven in clockwise direction or in the same direction as previously driven by the clockwise rotation of the traction wheels. As shown in Fig. 6, the bearing sleeve 46 and the supporting sleeve 64 form stops to limit the movements of the pinion yoke 72 and thereby determine the proper meshing engagement of the pinions 65 and 66 with the respective cooperating pinions 52 and 62. My device is so constructed that there is practically no lost motion in the rotation of the brush during reversal of movement of the traction wheels, whereby it is given unidirectional rotation at a relatively constant speed, and it is therefore to be understood that this is a superior mechanism in the carpet sweeper art.

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Obviously, some modifications of the details herein shown and described may be made without departing from the spirit of my invention or the scope of the appended claims and I do not wish, therefore, to be limited to the exact embodiment herein shown and described.

What is claimed is:

1. In a carpet sweeper having a rotatable brush and a traction wheel adapted to be rotated in alternately opposite directions by a back and forth movement of said sweeper over a surface, a gear mechanism comprising a drive gear fixed to said wheel, a brush pinion fixed to said brush and non-engageable with said gear, a brush idler pinion meshing with said brush pinion and in permanently fixed relation therewith, and a pair of spaced drive pinions in permanent meshing engagement with said gear, one of said drive pinions being intermittently engageable with said brush pinion and the other of said drive pinions being alternately engageable with said idler.

2. In a carpet sweeper having a rotatable brush and a traction wheel adapted to be rotated in alternately opposite directions by a back and forth movement of said sweeper over a surface, a gear mechanism comprising a drive gear fixed to said wheel, a brush pinion fixed to said brush and non-engageable with said gear, a brush idler pinion meshing with said brush pinion and in permanently fixed relation therewith, a pair of spaced drive pinions engageable with said brush pinion and said idler pinion, and a yoke revolvable about said gear for mounting said drive pinions and holding them in permanent meshing engagement therewith, whereby said yoke will rock about said gear and cause one of said drive pinions to be intermittently engaged with said brush pinion upon rotation of said traction wheel in one direction and the other of said drive pinions to be alternately engaged with said idler pinion during opposite rotation of said wheel.

3. In a carpet sweeper having a rotatable brush and a traction wheel adapted to be rotated in alternately opposite directions by a back and forth movement of said sweeper over a surface, a gear mechanism comprising a drive gear fixed to said wheel, a brush pinion fixed to said brush and non-engageable with said gear, a brush idler pinion meshing with said brush pinion and in permanently fixed relation therewith, a pair of spaced drive pinions engageable with said brush pinion and said idler pinion, a yoke revolvable about said gear for mounting said drive pinions and holding them in permanent meshing engagement therewith, and friction means between said drive gear and said yoke for dragging said yoke around in the direction of traction wheel rotation, whereby said drive pinions will be alternately brought into coacting engagement with the cooperating pinion.

4. In a carpet sweeper having a rotatable brush and a traction wheel, a gear mechanism comprising a driving gear permanently fixed to said traction wheel, a brush pinion fixed to and rotatable with said brush, an idler pinion in permanent meshing relation to said brush pinion, an oscillating yoke having its axis of oscillation coincident with the axis of said driving gear, two drive pinions spaced from each other and carried by said yoke

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in radial fixed position and in meshed relation with said driving gear, means for oscillating said yoke in both directions of rotation of said driving gear to bring one of said drive pinions into intermittent meshing relation with said brush pinion and alternately to bring the other of said drive pinions into meshing engagement with said idler pinion, and bearing sleeves coaxial with said brush pinion and said idler pinion, said yoke contacting with said bearing sleeves to limit the movement thereof in either direction, whereby the pinions are properly meshed with the cooperating pinions.

5. In a carpet sweeper having a traction wheel and a rotatable brush, means for maintaining predetermined uni-directional rotation of said brush, comprising a drive gear fixed to said wheel, a brush driving unit associated with said wheel, comprising a brush pinion and an idler pinion, and a drive pinion on each side of said unit, each of said drive pinions being permanently meshed with said gear and each alternately bringing said drive gear into cooperating engagement with said unit.

6. In a carpet sweeper having a traction wheel and a rotatable brush, means for maintaining predetermined unidirectional rotation of said brush, comprising a drive gear fixed to said wheel, a brush driving unit associated with said wheel, comprising a brush pinion and an idler pinion, a yoke having its axis of oscillation substantially coincident with the axis of said drive gear and having arms

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movable toward and from said driving unit, and a driving pinion carried by each arm and in permanent meshing engagement with said drive gear, each of said driving pinions being alternately engaged with and disengaged from said unit.

7. In a carpet sweeper having a rotatable brush and a traction wheel adapted to be rotated in alternately opposite directions, means operable by said wheel while rotating in either direction for driving said brush in the same direction of rotation, comprising a driving gear rotatable with said wheel, brush actuating gear means associated with and rotatable with said brush, oscillating gear means connecting said brush actuating means with said driving gear to drive said brush uni-directionally irrespective of the direction of rotation of said traction wheel, and a spring frictionally carried by said driving gear, said spring having arms engageable with said oscillating gear means to cause the same to be intermittently and alternately engaged with said brush actuating means.

EDMOND CLOUTIER, C.M.G., O.A., D.S.P., Queen's Printer and Controller of Stationery, Ottawa, 1958